

Vernon Discovery Investigation Report

Vernon and Los Angeles, California

Submitted to:

Department of Toxic Substances Control
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Prepared by:



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March 2009



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March 17, 2008

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PEN-22539

**Subject: Site Investigation Report
 Vernon Discovery Project
 Contract 07-T3405, Work Order No. 3-345-1.1-301353**

Dear Ms. Fierro,

We have prepared the Site Investigation Report for the Vernon Discovery Project in the Cities of Vernon and Los Angeles, California. Enclosed are three copies of the Report for your review. If you have any questions regarding this Report, please contact us at (626) 470-2462.

Sincerely,
TETRA TECH, INC.

Philip P. Novelty
Senior Geologist

Salar D. Niku, Ph.D., P.E
Program Manager

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On behalf of the California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC), Tetra Tech has prepared this Draft Investigation Report (Report) for the Vernon Discovery Project in the vicinity of the AAD Distribution and Dry Cleaning Services, Inc. (AAD Site) located at 2306 East 38th Street in Vernon, California. This project focused on the central portion of the City of Vernon, California and part of the City of Los Angeles, California (Project Area). The locations and area of investigation was determined by the DTSC and is shown on Figure 1.

1.1 PROJECT BACKGROUND

The project began with a site walk at 17 specific site locations or facilities in the Project Area. The site locations were pre-selected by the DTSC and each is considered as a separate “Site”. The individual Site locations are shown on Figure 2. Soil boring and soil gas probe locations were selected based on visual observations, accessibility, and Sanborn map references. Access was not granted on the property at nine facilities; therefore, some locations were marked on public property along City sidewalks and streets in order to investigate potential contamination underlying those Sites. This Report has been prepared based on findings from Tetra Tech’s investigation conducted during January and February 2009.

The investigation area is approximately a one-mile radius around the AAD Site. A Remedial Investigation (RI) conducted by DTSC indicated that the groundwater underlying the Site has been impacted by off-site sources. The hazardous substances found in the groundwater include volatile organic compounds (VOCs), primarily tetrachloroethene (PCE), and trichloroethylene (TCE).

Industrial activities within the area of investigation have potentially released VOCs and metals into the soil and groundwater. This investigation targeted the upper 30 feet of unsaturated soils overlying groundwater [estimated at 100 to 160 feet below ground surface (bgs)].

From the source of contamination, VOCs emit vapors that rise through pore space of unsaturated soils and can move laterally as well as vertically via advection and diffusion. Lateral movement can increase as groundwater plumes migrate a way from the source of contamination or if the ground surface is paved, preventing escape of vapors upwards (EPA 2008). These vapors, herein referred to as “soil gas”, are the target for temporary sampling probes that were installed throughout the project investigation area. Metals released to the subsurface generally do not migrate laterally until they come in to contact with water saturated soils, thus the collection of soil samples for metal content analysis was limited to areas within or adjacent to sites where a release of metals was considered most likely.

1.2 PURPOSE AND SCOPE

In an effort to detect VOCs and metals, a soil gas and limited soil matrix sampling investigation was conducted. The investigation of the 17 specific Sites, identified by the DTSC, included the following:

- A site walks with Tetra Tech and the DTSC that included selection of sampling locations. The initial Site visit and marking of boring locations with Jessy Fierro (DTSC) was conducted on July 3, 2008.
- Preparation of the Workplan (Tetra Tech 2008) that included a Field Sampling Plan (FSP), a Quality Assurance Project Plan (QAPP), and Health and Safety Plan (H&S Plan);

- Initiation of the permit process by the DTSC to acquire access for drilling and soil gas probe installations on properties in the Cities of Vernon and Los Angeles. Tetra Tech obtained permits from the Cities of Vernon and Los Angeles for drilling and soil gas probe installation in the streets and sidewalks;
- Pre-field logistics, coordination, and development of a schedule for sampling;
- Contacted USA Dig Alert for all proposed boring locations.
- During a second site walk on December 23-24, 2008, Tetra Tech and the DTSC confirmed the selection of the sampling locations. Based on these selected locations, Tetra Tech developed a schedule for sampling;
- Utility clearance with a subcontracted geophysical firm conducted on January 6-7, 2009; and
- Field investigation including limited soil matrix sampling, soil gas probe installation, and/or soil gas sampling at 49 locations in the Project Area.

1.3 PROJECT AREA

1.3.1 Specific Sites

The 17 specific Site names, addresses, and known onsite operations, along with a summary sampling matrix are listed in Table 1. Three of the facilities (2652 and 3248 Long Beach Avenue, and 1709 East 24th Street) are located in the City of Los Angeles. All of the remaining facilities are located in the City of Vernon.

1.3.2 Locations on the City Property (Vernon and Los Angeles)

Due to the lack of access to selected properties, locations were drilled and sampled on public property in City streets and sidewalks. The building addresses adjacent to these locations are summarized below.

- 3248 Long Beach Avenue, Los Angeles - two sidewalk locations
- 1709 East 24th Street, Los Angeles – three street locations.
- 1820 East 27th Street, Vernon – two street locations.
- 2065, 2068, and 2619 & 2709 East 37th Street, Vernon – nine street locations.
- 2039 and 2344 East 38th Street, Vernon – two street and two sidewalk locations.
- 3601 Santa Fe Avenue, Vernon – two sidewalk locations.
- 4533 Pacific Boulevard, Vernon – one street location.

2.0 PROJECT AREA SETTING

2.1 GEOLOGIC AND HYDROGEOLOGIC SETTING

The project area is located within the Inglewood Quadrangle and the Coastal Plain/Central Basin of Los Angeles County, near the northwestern edge of the Peninsular Ranges. The Rosecrans Hills, located southwest of the site near Inglewood and extending southward to Dominguez Hill, partially define the uplifted section within the Quadrangle along the Newport/Inglewood Fault Zone. East of this uplifted region, deposition of alluvial deposits from the Los Angeles and Rio Hondo-San Gabriel River systems upon the gently sloping Downey Plain contributed sediments to the area around and underlying the project area.

Encountered soil types were primarily poorly graded sand, silty sand, silt, and gravelly sand. No groundwater was encountered during drilling (depth groundwater may be approximately 100 to 160 feet bgs). There are no public water wells, surface water bodies, or creeks within the vicinity of the site. The uppermost aquifer beneath the site is the unconfined Gaspar Aquifer. Gaspar aquifer deposits generally consist of gravel and coarse sands with some interbedded silt or clay deposits (State of California Department of Water Resources 1961).

3.1 INVESTIGATION METHODOLOGY

Tetra Tech installed soil gas probe borings at a total of 49 locations at the 17 specific Sites including 21 locations in City streets and sidewalks. Boreholes were drilled with a Stratoprobe (direct-push method) drilling system in most locations or drilled with a limited access rig (LAR) in locations where overhead space or rig access was limited.

Soil sampling, where applicable, was accomplished concurrently with soil gas probe installation. Soil samples were collected from select locations at depths of 1, 5, and 10 feet bgs and soil gas samples were collected from each location. In general, collocated soil gas probes were installed within boreholes to the depths of 15 and 30 feet bgs. The depths for 14 soil gas probe locations were modified at eight Sites due to depth limitations of the LAR rig. The depths of the soil and soil gas probes for each sampling location and a sampling matrix are presented in Table 1. The soil sampling and soil gas probe locations at each Site are shown on Figures 2-A through 2-F.

The soil gas sampling and sample analysis were conducted in accordance with the *“Advisory - Active Soil Gas Investigations”*, dated January 28, 2003, that was developed by the DTSC and the Regional Water Quality Control Board (RWQCB) Los Angeles Region. Methods and procedures for the collection of soil gas samples are described below.

3.2 UTILITY CLEARANCE AND PERMITTING

Utilities were cleared in a three-phase process that included a geophysical survey (first and second phase), Underground Services Alert (USA) notification (first and second phase), and examination of subsurface structure maps and Geographic Information System (GIS) layers. The maps and GIS layers were accessed through the City of Los Angeles Department of Public Works Bureau of Engineering (Bureau of Engineering) NavigatELA online database (Bureau of Engineering 2008). An excavation permit was obtained to drill at locations in City streets.

3.2.1 Utility Clearance

Initially, the proposed boring locations were clearly marked with white paint. Prior to commencing work, Underground Services Alert (USA) was notified of the intent to conduct subsurface investigations at least 48 hours prior to commencement of intrusive field tasks. USA contacted utility owners of record within the Site vicinity to mark subsurface utilities and structures (or notify Tetra Tech that none were in the area of investigation). All utility owners of record, or their designated agents, were expected to clearly mark the position of their utilities on the ground surface in the public right-of-way adjoining the Sites.

On January 6-7, 2009, GeoVision, a geophysical subcontractor to Tetra Tech, cleared an approximate 10-foot by 10-foot area underlying each marked boring location for underground utilities and subsurface structures using low frequency ground penetrating radar (GPR) and magnetometry. The underground utilities and substructures were marked with spray paint on the pavement. When a subsurface feature was identified within or close to a previously marked boring location, the proposed location was relocated to a nearby location that was deemed clear. The proposed probe locations were not placed within three feet of the marked utility lines.

3.2.2 Permitting

Permits for soil borings in City streets and sidewalks were acquired through the City of Los Angeles Department of Public Works and the City of Vernon Department of Community Services & Water. The permits required the following prior to issuance:

City of Los Angeles – Application/Permit for Excavation

- Two copies of a Site Plans drawn to scale and signed and stamped by a Registered Civil Engineer to show boring locations, property lines, curbs, gutters, utility lines, sewer lines/laterals, and storm drains;
- A refundable cash bond posted with the Bureau of Engineering;
- Payment of the processing and inspection fee; and
- Proof of Tetra Tech's general liability insurance on file with the Board of Public Works.

City Of Vernon – Application for Encroachment Permit

- Description of work and Site Plans showing proposed boring locations and property lines;
- Payment of the processing and inspection fee; and
- Tetra Tech's Certificate of Liability Insurance.

3.3 SOIL BORINGS AND SOIL SAMPLING

3.3.1 Sample Identification

Sample identification names were standardized such that the first three digits indicate the site abbreviation. Following the first dash is the boring number. Finally, the depth at which the sample was collected follows the second dash. For Sample ID **RHB-1-10**:

RHB = Rittenhouse Boring

1 = Boring Number

10 = Sample Depth (feet bgs)

Thus, sample RHB-1-10 was collected at Rittenhouse (2440 East 38th Street), from primary boring number 1, and at a depth of 10 feet bgs. Note that boring numbers were pre-assigned and do not necessarily reflect the order in which the borings were drilled.

3.3.2 Soil Borings and Lithologic Logging

Soil borings were continuously cored to a maximum depth of 30 feet bgs or to the depth of core barrel refusal (or to the maximum limit capability of the Geoprobe equipment). The core was examined by the geologist for discoloration or contamination. Soil samples were collected at 1 foot, 5 feet, and 10 feet bgs; however, these depths were modified in a few cases based on field conditions.

Based on discussions with the DTSC Project Manager, one borehole at each Site was logged according to procedures described in the Unified Soil Classification System (USCS) using the Visual-Manual Procedure detailed in ASTM D-2488-93. The information recorded on the boring logs will include the boring identification, drilling company, name of geologist, method of drilling, sampler size and type,

sampling interval and depths, sample recovery, PID readings, soil classification and description, and boring location. The geologic logging was conducted under the direction of a Professional Geologist (P.G.).

Selected boreholes were logged to obtain lithologic information in the Project Area by a field geologist and according to procedures described in the Unified Soil Classification System (USCS) using the Visual-Manual Procedure detailed in ASTM D-2488-93 (ASTM 1993). Logged soil was evaluated in the field for potential contamination by visually inspection for any discoloration, odor, and/or unusual fill materials by the Field Geologist. In general, no significant odors or discolorations were observed in the soil.

Information recorded on the boring logs included the boring identification, drilling company, name of geologist, method of drilling, sampler size and type, sampling interval and depths, sample recovery, PID readings, soil classification and description, discoloration (if any), and boring location. Soil boring logs are presented in Appendix A.

Soil cuttings and waste soil from sampling were temporarily stored in a 55-gallon and labeled with contact information, contents, and dates of generation. The drum was stored onsite at 2440 East 38th Street, Vernon, California (the Rittenhouse Site), under the direction of the DTSC Project Manager.

3.3.3 Soil Sampling

A total of 152 discrete soil samples (including seven duplicate samples) were collected from the 49 borings. The soil borings were drilled using a Geoprobe type (direct-push method) drilling system to obtain discrete soil samples. A soil core was obtained with a 2-inch diameter by 4-foot long core barrel with a clear acetate sleeve. Soil samples for analysis were cut from the acetate sleeve at selected depths. The samples were sealed with Teflon film and plastic caps and labeled. The samples were labeled with a unique sample identification number and recorded on a chain-of-custody and boring log. Each soil sample was placed into individual zip-lock plastic bags and stored on ice.

Soil samples were delivered to the American Environmental Testing Laboratory, Inc. (AETL) in laboratory supplied coolers packed with ice. The sample coolers were transported by courier at the end of each day to meet holding time requirements.

3.4 INSTALLATION OF PROPOSED SOIL GAS PROBES

Using the direct-push method, 4-foot long drive rods, are threaded together to reach multiple depths and hydraulically driven into the subsurface. The rods were pushed down from the ground surface using a hydraulic hammer to the maximum sample depth of 30 feet bgs or to refusal (or to the maximum limit capability of the Geoprobe equipment, if less than 30 feet bgs). A gas-permeable filter (aquarium bubbler) connected to 1/8-inch diameter Nylaflow tubing were lowered to just above the bottom through the inside of the drive rods and backfilled (gravity fed) with approximately 1 foot of Monterey Sand filter pack, then the top was capped with bentonite and hydrated with water up to the next sample depth of 15 feet bgs. The shallow soil gas probe will then be installed in the same way, and the borehole was sealed to the surface with hydrated bentonite. The drive rods were pulled up slowly while the probes are set to ensure that there is no caving, or if competent lithology is identified by the project geologist, the probes may be installed in open borehole created from the extraction of soil samples. At the surface, the ends of the two probe tubes were sealed with caps or Swagelok valves. The probes were sealed at the surface with hydrated granular bentonite and allowed to set for a minimum of 30 minutes before sampling. The installation depths of soil gas probes at each location are shown in Table 1.

3.5 SOIL GAS SAMPLING

3.5.1 Purge Volume Tests

Purge volume tests were conducted at a depth of 15 feet below eight selected sampling locations to determine the optimum purge volumes. When warranted, a purge volume test was conducted at the first sampling location at the Site. Purge volume tests (1, 3, and 7 volumes) were conducted to yield the highest contaminant concentrations. The resulting analytical data was examined by the Field Geologist and the purge volume for the remaining locations at the Site was selected based on the sample containing the highest concentrations of target analytes (PCE, TCE, and benzene). A default of three purge volumes was selected when the purge volume test was inconclusive. The results for each location are summarized below and are presented in Table 2.

Rittenhouse - 2440 East 38th Street – A detected benzene concentration was slightly higher in the one-volume sample than in the three- or seven-volume sample, thus one-purge volume was selected for subsequent sample collection.

Maas Hansen Steel Corp. - 2435 East 37th Street - All results were non-detect and the test was inconclusive. Previously, a one-volume purge attained maximum target concentrations in similar soil (the Rittenhouse Site). Thus, a one-volume purge was selected for subsequent sample collection.

Rebilt Metalizing - 2229 East 38th Street - The detected PCE concentrations following a seven-volume purge were slightly higher than those detected following a one- or three-volume purge, thus a seven-volume purge was selected for subsequent sample collection.

Goldstar - 2652 Long Beach Avenue – The detected PCE concentrations following a three-volume purge were slightly higher than those detected following a one or seven-volume purge, thus a three-volume purge was selected for subsequent sample collection. Three purge volumes were also used at Downtown Metal, Catalina Concrete, and C&M Metal sites, due to similar soil type and proximity to the Goldstar Site.

TC Toys - 4545 Pacific Boulevard - The detected PCE concentration was higher following a three-volume purge than those detected following the one- or seven-volume purges, thus a three-volume purge was selected for subsequent sample collection. Three purge volumes were also used at the Windsor Site due to similar soil type and proximity to the TC Toys Site.

Hannibal - 2068 East 37th Street - All results were non-detect and the test was inconclusive. Previously, a three-volume purge attained maximum target concentrations in similar soil. Thus, a three-volume purge was selected for subsequent sample collection. Three purge volumes were also used at The Pour House, Commercial Die Casting Co., and Laundry Atelier sites, due to similar soil type and proximity to the Hannibal Site.

Exxon Mobil - 2619 & 2709 East 37th Street - All results were non-detect and the test was inconclusive. Previously, a three-volume purge attained maximum target concentrations in similar soil. Thus, a three-volume purge was selected for subsequent sample collection.

New Star - 2109-2115 East 27th Street - All results were similar and the test was inconclusive. Previously, a three-volume purge attained maximum target concentrations in similar soil. Thus, a three-volume purge was selected for subsequent sample collection. Three purge volumes were also used at Santa Fe Machine Works due to similar soil type and to the New Star Site.

3.5.2 Soil Gas Sampling Procedures

Soil vapor was withdrawn from the end of the inert tubing that runs from the sampling tip to the surface using a 60 milliliter (ml) syringe connected to the tubing via a 3-way Swagelok valve. The probe tip and sampling tubing was purged based on the optimum purge volume as described above. A sample of in-situ soil vapor was then withdrawn and immediately transferred to the mobile lab for analysis. The samples were analyzed within 30 minutes from the time of collection. The use of small calibrated syringes allowed for careful monitoring of purge and sample volumes. This procedure ensured that an adequate sample flow was obtained without excessive pumping of air or introduction of surface air into the samples.

Purging and sampling was timed so that the flow rate did not exceed 200 milliliters per minute (ml/min). This was accomplished by withdrawing the plunger on the syringe at a constant rate for 20 seconds. The sample collector noted the collection time and the volume of sample collected on a log sheet, and also recorded any resistance to sample flow which may have been felt on the syringe during collection.

A total of 120 soil gas samples (including 8 duplicate QA/QC and 16 purge volume test samples) were collected from 96 probes located within the Project Area, with on site sample analysis provided by a mobile laboratory.

Samples of in-situ soil vapor were withdrawn with 60-milliliter (ml) polypropylene disposable syringes from installed sample ports and immediately transferred to the mobile laboratory for analysis. The samples were analyzed or preserved within 30 minutes from the time of collection. Duplicate soil gas samples were collected and analyzed for QA/QC purposes.

A tracer gas consisting of 1,1-difluoroethane (DFA), or one of the tracer compounds listed in the guidance document, was used to detect potential ambient air intrusion into soil gas samples during soil gas sampling at each probe. DFA is commonly found in commercial aerosol dust removal products. A cloth saturated with DFA was placed at the ground surface collar of the gas probes and near the sampling assembly during purging and sampling, and the samples were analyzed for DFA.

3.6 SITE SPECIFIC SOIL AND SOIL GAS SAMPLING

Rittenhouse - 2440 East 38th Street

Eleven soil gas samples (including one duplicate and two additional for a purge test) were collected from probes installed in four borings to the depths of 15 and 30 feet bgs. Twelve soil samples were collected at depths of 1, 5, and 10 feet bgs from the borehole cores (Table 1, Figure 2-B). A strong (hydrocarbon?) odor was observed in soil sample RHB-1-5 and a slight odor at approximately 15 feet bgs in the same boring.

Maas Hansen Steel Corp. - 2435 East 37th Street

Thirteen soil gas samples (including one duplicate and two additional for a purge test) were collected from probes installed in five borings to the depths of 15 and 30 feet and one location at 15 and 25 feet bgs. The probe installation depths were adjusted due to encountered soil types and limitations of the LAR. Fifteen soil samples were collected at depths of 1, 5, and 10 feet bgs from the borehole cores (Table 1, Figure 2-B). In boring MB-3, traces of brick and black stain were observed in the soil from the surface to the approximate depth of twenty feet. This denotes that fill material exists to that depth. In boring MB-5, traces black stains were observed in the soil from the surface to the approximate depth of five feet.

Rebilt Metalizing - 2229 East 38th Street

Two of the borings located inside the building were drilled using the LAR and one outside boring was drilled using the Stratoprobe rig. Eleven soil gas samples (including two duplicates) were collected from probes installed in four borings to depths of 15 and 27 feet, 15 and 28 feet, and 15 and 30 feet bgs. Thirteen soil samples (including one duplicate) were collected at depths of 1, 5, and 10 feet bgs from the borehole cores (Table 1, Figure 2-C). In boring RB-3, traces of metal were observed in the soil from the surface to the approximate depth of five feet. This denotes fill material exists to that depth.

Santa Fe Machine Works - 2344 East 38th Street

Two boring locations were drilled in the sidewalk using the LAR. Four soil gas samples were collected from probes installed in six borings to depths of 15 and 26 feet in one and 15 and 22 feet bgs in the other. The probe installation depths were adjusted due to encountered soil types and limitations of the LAR. Six soil samples were collected at depths of 1, 5, and 10 feet bgs from the borehole cores (Table 1, Figure 2-C).

Goldstar - 2652 Long Beach Avenue

Nine soil gas samples (including one duplicate, and two additional for a purge volume test) were collected from probes installed in three borings to depths of 15 and 30 feet bgs. Nine discrete soil samples were collected at depths of 1, 5, and 10 feet bgs from the borehole cores (Table 1, Figure 2-E). In boring GSB-3, traces of brick were observed in the soil from the surface to the approximate depth of four feet. This denotes fill material exists to that depth.

Downtown Metal - 3248 Long Beach Avenue

Two borings were advanced in the sidewalk. Four soil gas samples were collected from probes at depths of 15 and 30 feet bgs. Six soil samples were collected at depths of 1, 5, and 10 feet bgs from the borehole cores (Table 1, Figure 2-E).

TC Toys - 4545 Pacific Boulevard

Eight soil gas samples (including two for a purge volume test) were collected from probes installed in three borings to depths of 15 and 30 feet bgs. Twelve discrete soil samples (including one duplicate) were collected at depths of 1, 5, and 10 feet bgs from the borehole cores (Table 1, Figure 2-A). In boring TCB-2, traces of brick were observed in the soil from the surface to the approximate depth of two feet. This denotes fill material exists to that depth.

Hannibal - 2068 East 37th Street

Three boring location were drilled in the street (along East 37th Street) using the Stratoprobe rig. Probe installation depths were targeted at 15 and 30 feet bgs; however, the installation depths were adjusted due to encountered soil types and limitations of the LAR. Six soil gas samples (including two samples collected for a purge volume test) were collected from probes installed in two borings to depths of 15 and 26 feet and 15 and 26 feet bgs. Six soil samples were collected at depths of 1, 5, and 10 feet bgs from the borehole cores (Table 1, Figure 2-D).

The Pour House - 2065 East 37th Street

Two boring location were drilled in the street (along Ross Street) using the LAR rig. Probe installation depths were targeted at 15 and 30 feet bgs; however, the installation depths were adjusted due to encountered soil types and limitations of the LAR. Five soil gas samples (including one duplicate) were collected from probes installed in two borings to depths of 15 and 30 feet bgs (Table 1, Figure 2-D).

Windsor - 4533 Pacific Boulevard

Two soil gas samples were collected from probes installed in one boring to depths of 15 and 30 feet bgs. Three soil samples were collected at depths of 1, 5, and 10 feet bgs from the borehole cores (Table 1,

Figure 2-A).

Exxon Mobil - 2619 & 2709 East 37th Street

Five boring locations were drilled in the street (along East 37th Street) using the Limited Access Rig (LAR). Probe installation depths were targeted at 15 and 30 feet bgs; however, the installation depths were adjusted due to encountered soil types and limitations of the LAR. Thirteen soil gas samples (including one duplicate, and two additional samples collected for a purge volume test) were collected from probes installed at depths of 5 and 26 feet bgs and in one boring to depths of 15 and 24 feet bgs. The probe installation depths were adjusted due to encountered soil types and limitations of the LAR (Table 1, Figure 2-B).

New Star - 2109-2115 East 27th Street

Nine soil gas samples (including one duplicate, and two additional for a purge test) were collected from probes installed in three borings to depths of 15 and 30 feet bgs. Nine soil samples were collected at depths of 1, 5, and 10 feet bgs from the borehole cores (Table 1, Figure 2-F). In boring NSB-3, traces of brick and a nail were observed in the soil from the surface to the approximate depth of five feet. This denotes fill material exists to that depth.

Laundry Atelier 2039 East 38th Street

Two boring locations were drilled in the street (along East 37th Street) using the LAR rig. Probe installation depths were targeted at 15 and 30 feet bgs; however, the installation depths were adjusted due to encountered soil types and limitations of the LAR. Four soil gas samples were collected from probes installed in borings to depths of 15 and 24 feet bgs (Table 1, Figure 2-D).

Commercial Die Casting Co. - 2053 East 38th Street

Two borings located inside the building were drilled using the LAR rig and one outside boring was drilled using the Stratoprobe rig. Six soil gas samples were collected from probes installed in three borings to depths of 15 and 26 feet, 15 and 24 feet, and 15 and 22 feet bgs. The probe installation depths were adjusted due to encountered soil types and limitations of the LAR. Thirteen soil samples (including one duplicate) were collected at depths of 1, 5, and 10 feet bgs from the borehole cores (Table 1, Figure 2-D).

C&M Metal - 1709 East 24th Street

Six soil gas samples were collected from probes installed in three borings in the street to depths of 15 and 30 feet bgs. Nine soil samples were collected at depths of 1, 5, and 10 feet bgs from the borehole cores (Table 1, Figure 2-E).

Anchor Glass Container (Cal Plush) - 3601 Santa Fe Avenue

Two boring locations were drilled in the sidewalk using the LAR. Five soil gas samples (including one duplicate) were collected from probes installed in two borings, one location at depths of 5 and 15 feet and the other at 5 and 20 feet bgs. The probe installation depths were adjusted due to encountered soil types and limitations of the LAR. Six soil samples were collected at depths of 1, 5, and 10 feet bgs from the borehole cores (Table 1, Figure 2-C).

Catalina Concrete 1820 East 27th Street

Two borings were drilled in the street (along East 27th Street). Four soil gas samples were collected from probes installed in two borings to depths of 15 and 30 feet bgs. Six soil samples were collected at the depths of 1, 5, and 10 feet bgs from the borehole cores (Table 1, Figure 2-F). In boring CPB-1, traces of brick were observed in the soil surface to the approximate depth of four feet. This denotes fill material to that depth.

4.1 SOIL GAS SAMPLING RESULTS

Soil gas samples analyses were performed by H&P Mobile Geochemistry using onsite mobile lab. The soil gas samples were analyzed by EPA Method SW8260B with the lowest reporting limits possible. Targeted VOCs (PCE, TCE, and benzene) were detected above the Industrial California Human Health Screening Levels (CHHSLs) in soil gas samples at 11 of the 17 specific sites. The analytical results of soil and soil gas samples are summarized in Tables 2 through 6. The analytical laboratory reports for soil and soil gas samples are included in Appendix B (on disc). Significant contaminant concentrations are discussed below.

4.1.1 Soil Gas Results from Specific Sites**Rittenhouse - 2440 East 38th Street**

The compound benzene was detected above the Residential and Industrial CHHSLs of 0.0362 micrograms per liter (ug/L) and 0.122 ug/L, respectively, in six out of eleven soil gas samples at this Site. The highest benzene concentration (11 ug/L) was detected in the 30-foot sample collected from location RHB-2. Benzene was not detected above the reporting limit in five soil gas samples at this Site. TCE and PCE were not detected above the laboratory reporting limits. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

Maas Hansen Steel Corp. - 2435 East 37th Street

The compound benzene was detected above the Residential CHHSL of 0.0362 ug/L in 1 out of 13 soil gas samples. The single benzene concentration (0.1 ug/L) was detected in the 30-foot sample collected from location MB-4. Benzene was not detected above the reporting limit in any of the other samples at this Site. TCE and PCE were not detected above their laboratory reporting limits. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

Rebilt Metalizing - 2229 East 38th Street

Targeted VOCs were detected in all nine soil gas samples collected at the Site. PCE was detected above the Residential and Industrial CHHSLs of 0.180 and 0.603 ug/L, respectively, in all nine samples. The highest PCE concentrations were detected in the 28-foot sample collected from location RB-2 at a concentration of 31 ug/L. Additionally, TCE was detected in sample RB-2-28 at a concentration of 0.11 ug/L at this Site. This TCE concentration is below the Residential and Industrial CHHSLs. Benzene was not detected above the laboratory reporting limit. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

Santa Fe Machine Works - 2344 East 38th Street

Targeted VOCs were detected in all four soil gas samples collected at the Site. PCE was detected above the Residential CHHSL of 0.180 ug/L in all four samples. In addition, PCE was detected above the Industrial CHHSL 0.603 ug/L in the 22-foot sample collected from location SFB-2. The highest PCE concentration was detected in the 22-foot sample collected from location SFB-2 at a concentration of 0.84 ug/L. TCE and benzene were not detected above their laboratory reporting limits. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

Goldstar - 2652 Long Beach Avenue

Targeted VOCs were detected in all nine soil gas samples collected at the Site. PCE was detected above the Residential and Industrial CHHSLs of 0.180 and 0.603 ug/L, respectively in four of the nine samples (including purge samples in GSB-1). The highest PCE concentration was detected in the 30-foot sample collected from location GSB-1 at a concentration of 4.9 ug/L. Additionally, TCE was detected in three

samples (including one duplicate). The highest TCE concentration was detected in the 30-foot sample from location GSB-1 at a concentration of 0.28 ug/L, which is below the Residential and Industrial CHHSLs of 0.528 and 1.77 ug/L, respectively. Benzene was detected above the Residential CHHSL of 0.0362 ug/L in three of the nine samples. In addition, benzene was detected above the Industrial CHHSL of 0.122 ug/L in sample GSB-3-15. The highest benzene concentration was detected in the 15-foot sample collected from location GSB-3 at a concentration of 0.13 ug/L. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

Downtown Metal - 3248 Long Beach Avenue

Targeted VOCs were detected in all four soil gas samples collected at the Site. PCE was detected above the Residential and Industrial CHHSLs of 0.180 and 0.603 ug/L, respectively, in all four samples. The highest PCE concentration was detected in the 30-foot sample collected from location DM B-1 at a concentration of 12 ug/L. Additionally, TCE was detected in three samples. The highest TCE concentration was detected at 1.8 ug/L, which is above the Residential and Industrial CHHSLs of 0.528 and 1.77 ug/L, respectively. Benzene was not detected above the laboratory reporting limits. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

TC Toys - 4545 Pacific Boulevard

Targeted VOCs were detected in all ten soil gas samples collected at the Site. PCE was detected above the Residential CHHSL of 0.180 ug/L in two of the ten samples. The highest PCE concentration was detected in the 30-foot sample collected from location TCB-4 at a concentration of 0.26 ug/L. Additionally, benzene was detected above the Residential and Industrial CHHSLs of 0.0362 and 0.122 ug/L, respectively, in six of the ten samples. The highest benzene concentration was detected in the 30-foot sample collected from location TCB-3 at a concentration of 0.29 ug/L. TCE was not detected above the laboratory reporting limits. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

Hannibal - 2068 East 37th Street

Targeted VOCs were detected in two of the six soil gas samples collected at the Site. PCE was detected below the Residential and Industrial CHHSLs of 0.180 and 0.603 ug/L, respectively, in two samples. The highest PCE concentration was detected in the 30-foot sample collected from location HB -2 at a concentration of 0.14 ug/L. Additionally, TCE was detected in the same sample at a concentration of 0.31 ug/L. Benzene was not detected above the laboratory reporting limits. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

The Pour House - 2065 East 37th Street

Targeted VOCs were detected in one out of five soil gas samples collected at the Site. PCE was detected below the Residential and Industrial CHHSLs of 0.180 and 0.603 ug/L, respectively, in the one sample. The highest PCE concentration was detected in the 30-foot sample collected from location PH-2 at a concentration of 0.14 ug/L. TCE and Benzene were not detected above the laboratory reporting limits. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

Windsor - 4533 Pacific Boulevard

The targeted VOCs (PCE, TCE, and benzene) were not detected above the laboratory detection limits in the two soil gas samples collected at the Site. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

Exxon Mobil - 2619 & 2709 East 37th Street

The targeted VOCs (PCE, TCE, and benzene) were not detected above the laboratory detection limits in the two soil gas samples collected at the Site. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

New Star - 2109-2115 East 27th Street

Targeted VOCs were detected in all nine soil gas samples collected at the Site. PCE was detected above the Residential CHHSL of 0.180 ug/L in three of the nine samples. The highest PCE concentration was detected in the 30-foot sample collected from location NSB-3 at a concentration of 0.41 µg/L. Additionally, TCE was detected in five samples (three above the Residential CHHSL of 0.528 ug/L). The highest TCE concentration was detected in the 30-foot sample in location NSB-3 at 4.4 ug/L, which is above the Residential and Industrial CHHSLs of 0.528 and 1.77 ug/L, respectively. Benzene was detected above the Residential and Industrial CHHSLs of 0.0362 ug/L and 0.122 ug/L, respectively, in all samples except two of the purge volume samples in NSB-2-15. The highest benzene concentration was detected in the 15-foot sample collected from location NSB-3 at a concentration of 0.3 µg/L. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

Laundry Atelier 2039 East 38th Street

Targeted VOCs were detected in all four soil gas samples collected at the Site. PCE was detected above the Residential CHHSL of 0.180 ug/L in two samples. The highest PCE concentration was detected in the 24-foot sample collected from location LB-1 at a concentration of 0.26 µg/L. TCE was detected in all four samples above the Residential CHHSL of 0.528 ug/L and two samples were above the Industrial CHHSL of 1.77 ug/L. The highest TCE concentration of 3.5 ug/L was detected in the 24 foot sample at location LB-2. Benzene was not detected above the laboratory reporting limits. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

Commercial Die Casting Co. - 2053 East 38th Street

Targeted VOCs were detected in all six soil gas samples collected at the Site. PCE was detected above the Residential CHHSL of 0.180 ug/L in all 6 samples. PCE was detected above the Industrial CHHSLs of 0.603 ug/L in five samples. The highest PCE concentration of 4.7 ug/L was detected in the 24-foot sample collected from location CDB-2. TCE was detected in five samples above the Residential CHHSL of 0.528 ug/L and two samples were above the Industrial CHHSL of 1.77 ug/L. The highest TCE concentration of 3.3 ug/L was detected in the 26-foot sample at location CDB-1. Benzene was detected at 0.14 ug/L, above the Residential and Industrial CHHSLs of 0.0362 ug/L and 0.122 ug/L, respectively, in the 24-foot sample at location CDB-2. The benzene concentration of 0.14 ug/L was detected in CDB-2-24. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

C&M Metal - 1709 East 24th Street

Targeted VOCs were detected in three out of six soil gas samples collected at the Site. PCE was detected, above the Residential CHHSL of 0.180 ug/L in only one sample (CMB-1-30) at a concentration of 0.4 ug/L. TCE and Benzene were not detected above the laboratory reporting limits. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

Anchor Glass Container (Cal Plush) - 3601 Santa Fe Avenue

Targeted VOCs were detected in all five soil gas samples collected at the Site. Benzene was detected above the Residential CHHSL of 0.0362 µg/L in all five samples. In addition, benzene was detected at 0.15 ug/L, above the Industrial CHHSL of 0.122 ug/L, in sample AGB-2-20. TCE and PCE were not detected above the laboratory reporting limits. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

Catalina Concrete 1820 East 27th Street

Targeted VOCs were detected in three out of four soil gas samples collected at the Site. Benzene was detected above the Residential CHHSL of 0.0362 µg/L in three samples. In addition, benzene was detected above the Industrial CHHSL of 0.122 ug/L, in samples CPB-1-15 and CPB-1-30 at 0.13. TCE and PCE were not detected above the laboratory reporting limits. No other VOC concentrations exceeded the CHHSLs at this Site (Table 2 and Figure 3).

All Sites

Additionally, three other non-targeted VOCs were detected in samples at this Site. Bromofluorobenzene, difluoromethane, and toluene-db were detected in all soil gas samples analyzed. Bromofluorobenzene was detected in samples at concentrations ranging from 2.3 to 2.64 $\mu\text{g/L}$. Dibromofluoromethane was detected in samples at concentrations ranging from 2.31 to 3.11 $\mu\text{g/L}$. Toluene-db was detected in samples at concentrations ranging from 2.33 to 3.53 $\mu\text{g/L}$. There are currently no CHSLs for bromofluorobenzene, dibromofluoromethane, or toluene-db (Table 2).

4.2 SOIL SAMPLING RESULTS

A total of 108 soil samples were collected for laboratory analyses. Selected soil samples were analyzed for volatile organic compounds by U.S. Environmental Protection Agency (EPA) Method 8260B and Title 22 Metals by EPA Methods SW610 and SW7471. Based on field observations and hand-held photoionization detector (PID) readings, ten soil samples were collected and analyzed for semi-volatile organic compound (SVOC) by EPA Method SW8270C.

Benzene and PCE were detected in soil sample GSB-1-5 at concentrations of 5.9 $\mu\text{g/kg}$ and 5.89 $\mu\text{g/kg}$, respectively at the Goldstar Site. These concentrations in soil may correlate with the soil gas concentrations of benzene (0.1 $\mu\text{g/L}$ at 30 feet bgs) and PCE (4.4 $\mu\text{g/L}$ at 15 feet bgs and 4.9 $\mu\text{g/L}$ at 30 feet bgs) in boring GSB-1. Benzene was detected in soil sample GSB-2-5 at a concentration of 3.28 $\mu\text{g/kg}$. This soil concentration may correlate with the soil gas concentrations of benzene of 0.13 $\mu\text{g/L}$ at 15 feet bgs and 0.12 $\mu\text{g/L}$ at 30 feet bgs in GSB-3. Both of these borings were located onsite and the correlation between soil and soil gas results could suggest a potential onsite source.

PCE was detected in only one soil sample RB-2-5 at a concentration of 9.45 $\mu\text{g/kg}$ at the Rebuilt Metalizing Site. These concentrations in soil may correlate with the soil gas concentrations of PCE (8.4 $\mu\text{g/L}$ at 15 feet bgs) in boring RB-2.

Benzene was detected in soil samples CDB-1-5 and CDB-2-5 at concentrations of 3.86 $\mu\text{g/kg}$ and 3.77 $\mu\text{g/kg}$, respectively at the Commercial Diecast Site. Only one soil gas concentration of benzene was detected at 0.14 $\mu\text{g/L}$ in sample CDB-1-24 (24 feet bgs) at the same Site. The depths of the benzene detections do not correlate.

Minor concentrations of benzene were also detected in soil samples RB-1-5, DMB-2-5, LB-1-5, LB-2-5, SFB-1-5, SFB-2-5, and MB-5-5.

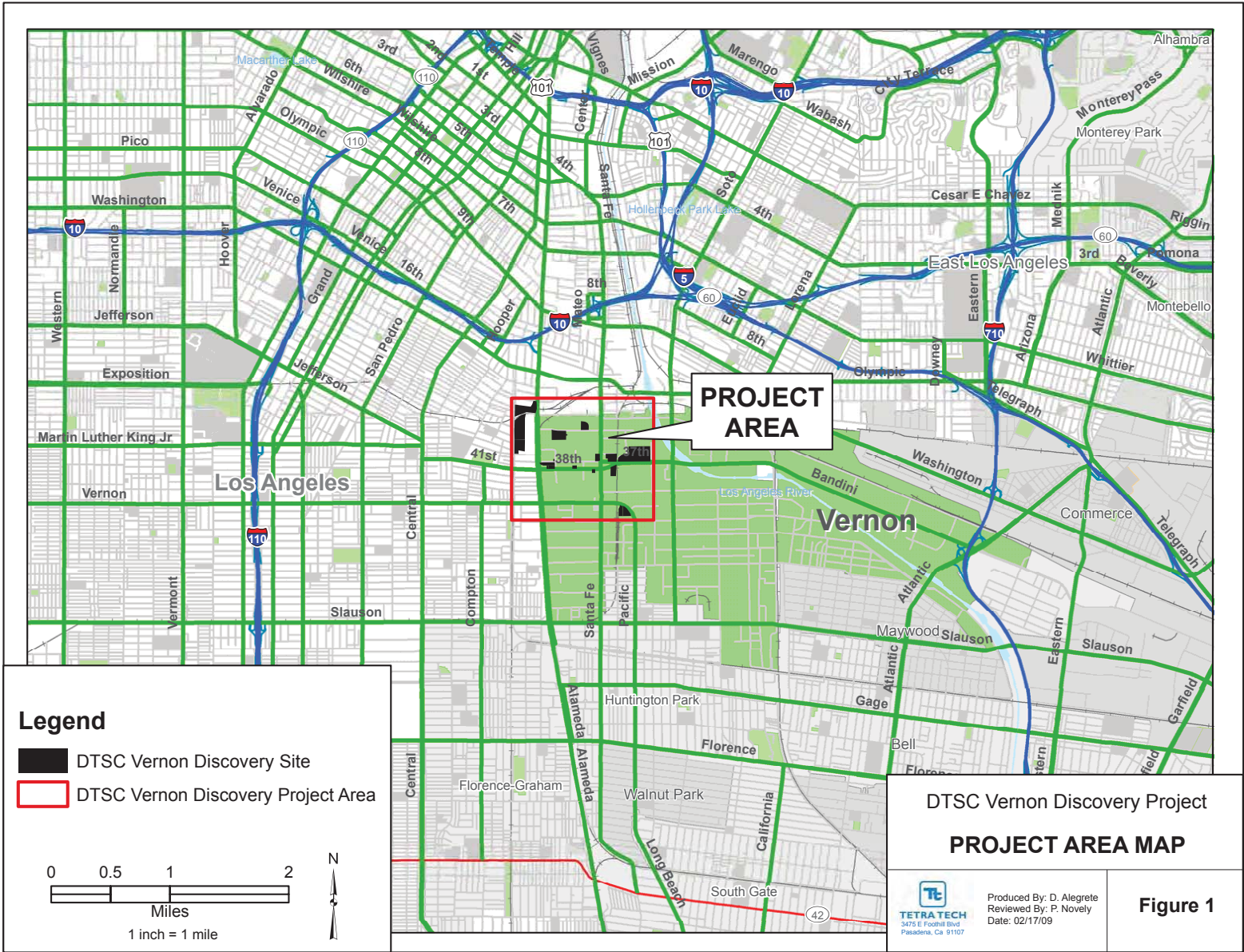
Results of purgeables analyses indicate that concentrations of naphthalene exceed the California Modified Preliminary Remediation Goal (PRG) of 4,200 $\mu\text{g/kg}$ in three soil samples. Naphthalene concentrations were detected at 32,000 $\mu\text{g/kg}$ in sample MB-5-5, 8,950 $\mu\text{g/kg}$ in sample RHB-1-5, and 5,230 $\mu\text{g/kg}$ in sample RHB-2-5.

Results of metals analyses indicated that arsenic exceeded the industrial PRG of 1.6 mg/kg and the modified PRG of 0.25 mg/kg in three soil samples from one site. Arsenic concentrations were detected at 43.3 mg/kg in sample MB-1-1, 48.3 mg/kg in sample MB-5-10, and 65.5 mg/kg in sample MB-5-5 (at the Maas Hansen Steel Corporation Site).

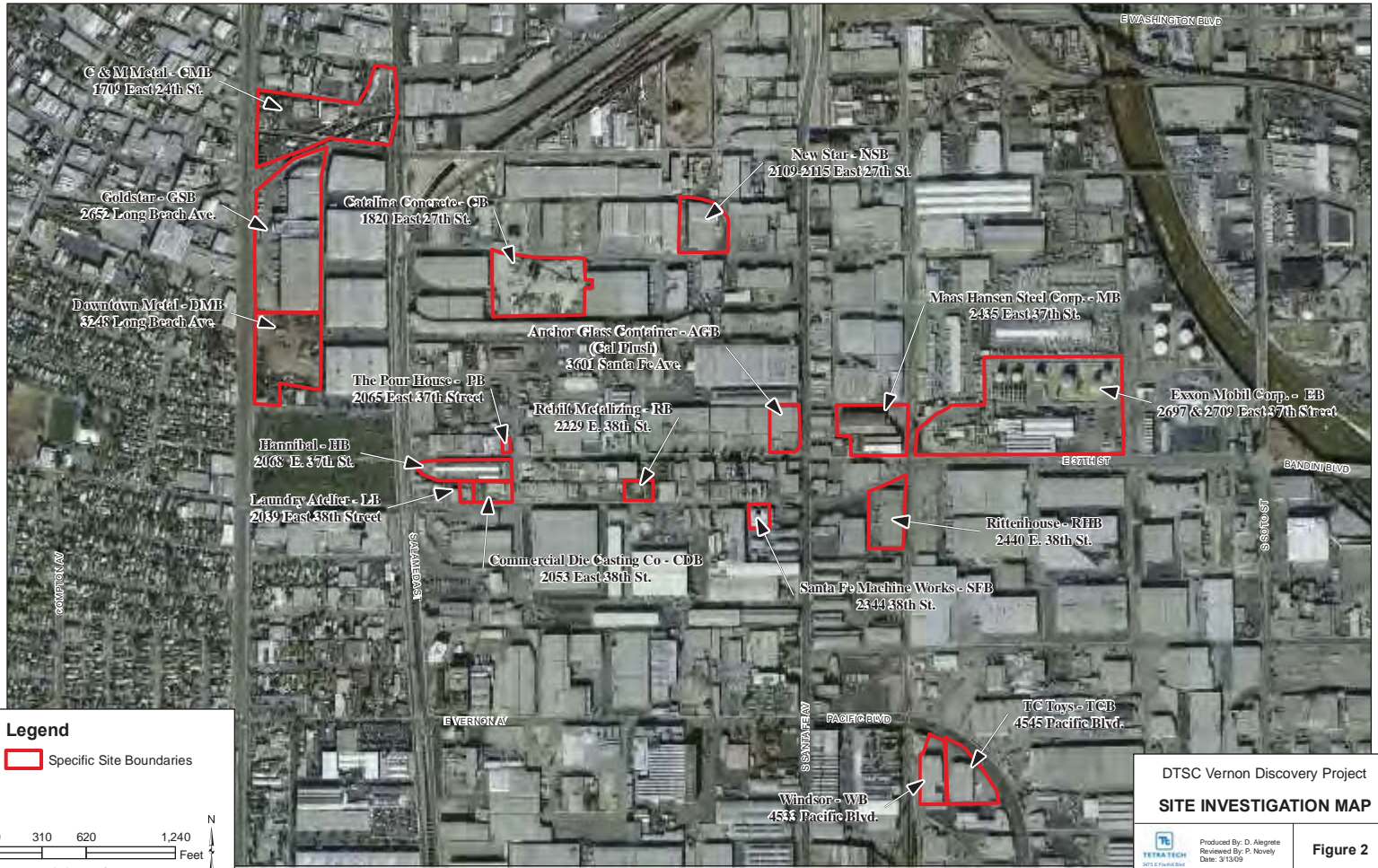
The DTSC established a regional background arsenic concentration in soil that can be used as a screening tool for sites throughout Southern California. A Probability Plot and statistical analysis of a large data set from school sites in Los Angeles County gave an upper-bound background arsenic concentration of 12 mg/kg . This finding suggests that in Southern California, 12 mg/kg may be a useful screening number for evaluating arsenic as a chemical of potential concern.

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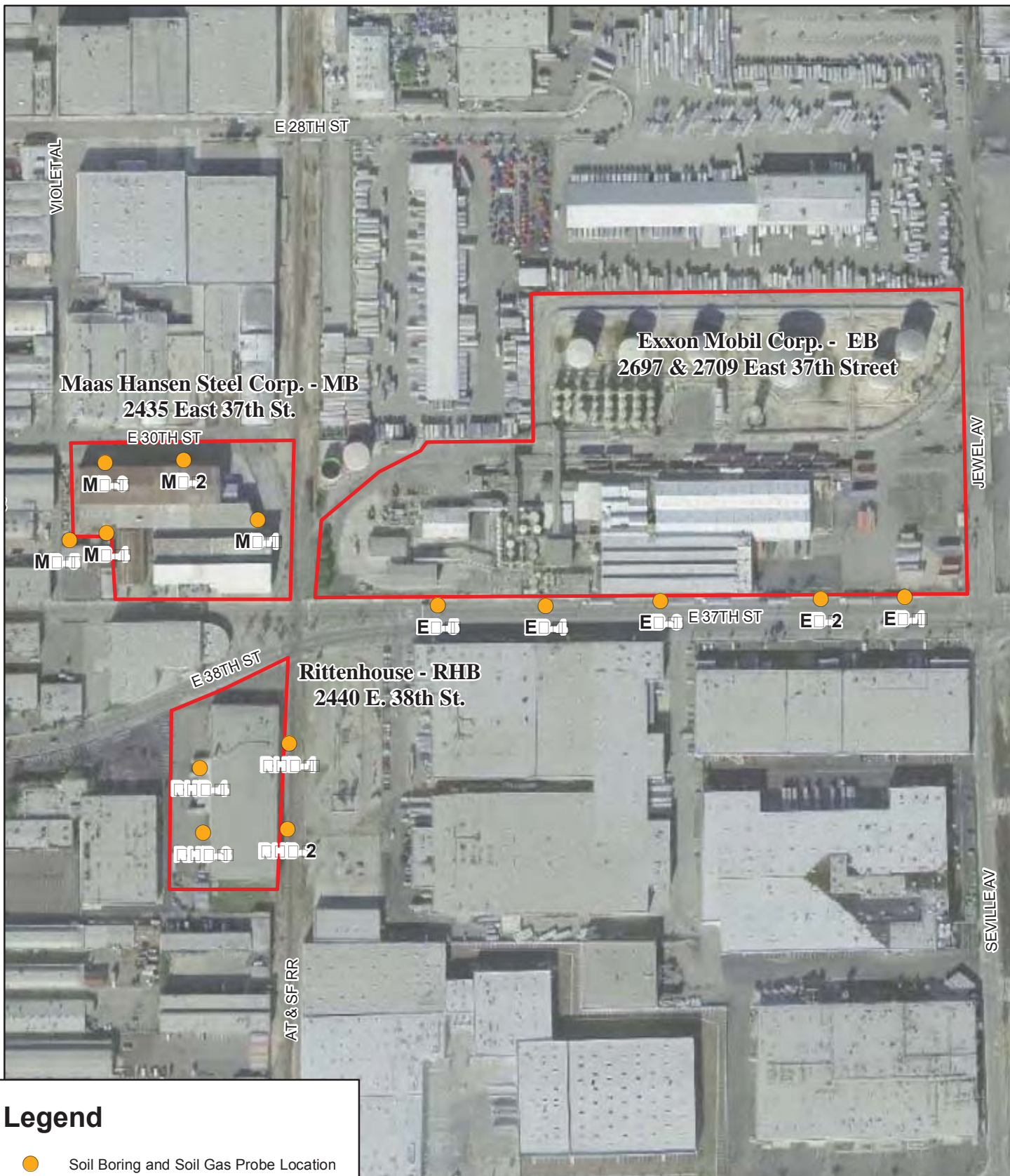
FIGURES



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Legend

- Soil Boring and Soil Gas Probe Location
- Site Boundary

0 80 160 320
 Feet
 1 inch = 300 feet



DTSC Vernon Discovery Project

SITE LOCATION MAP



Produced By: D. Alegrete
 Reviewed By: P. Novely
 Date: 02/17/09

Figure 2



